

Amendments to the claims:

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1. (Original) A method of storing digital data within a Flash Memory System comprising the steps:
- a. mapping a non-volatile memory medium within the Flash Memory System into a plurality of independently addressable, independently programmable and independently erasable memory blocks including a plurality of Dedicated Data Blocks and a plurality of Dedicated Overhead Blocks comprising a first Dedicated Overhead Block and a second Dedicated Overhead Block;
 - b. mapping each of the plurality of Dedicated Overhead Blocks into a plurality of pages, wherein the plurality of pages within each Dedicated Overhead Block are addressed according to an identical set of consecutive page addresses;
 - c. mapping each of the plurality of Overhead Pages into a plurality of Overhead Segments, wherein the plurality of Overhead Segments within each page are addressed according to an identical set of consecutive segment addresses, each Overhead Segment comprising a plurality of registers including a Physical Address Register and a flag field; and
 - d. correlating the plurality of consecutive Overhead Page addresses within the first Dedicated Overhead Block to a respective plurality of consecutive Virtual Logical Block Addresses including a first Logical Block Address defining a first Logical Block of User Data correlated to a first Overhead Page address defining a first Overhead Page.
2. (Original) The method according to Claim 1 further comprising the steps:
- a. receiving from a host a first set of User Data defined according to the first Virtual Logical Block Address;
 - b. storing the first set of User Data in a first Dedicated Data Block defined according to a first Virtual Physical Block Address;
 - c. identifying a first available segment within the first page, an available Overhead Segment comprising an Overhead Segment that is unused, non-defective, and not

8 obsolete, and wherein the first available segment is defined by a lowest segment
9 address of available segments comprising the first page;
10 d. storing an address of the first Dedicated Data Block in the Physical Address
11 Register of the first available Overhead Segment.

1 3. (Original) The method according to claim 1 wherein each of the Overhead Segments
2 further comprises an error correction code.

1 4. (Original) The method according to Claim 1 further comprising the step of consolidating
2 all current Overhead Segments within the first Dedicated Overhead Block into a second
3 Dedicated Overhead Block, a current Overhead Segment comprising an Overhead
4 Segment that is used, non-defective, and not obsolete.

1 5. (Original) The method according to Claim 4 wherein the step of consolidating the first
2 Dedicated Overhead Block into a second Dedicated Overhead Block further comprises
3 the steps:

- 4 a. moving data stored within a current Overhead Segment within the first Overhead
5 Page of the first Dedicated Overhead Block to a replacement Overhead Segment
6 within a second Overhead Page within the second Dedicated Overhead Block, the
7 replacement Overhead Segment being a lowest addressable segment within the
8 second Overhead Page, the second Overhead Page being defined by an identical
9 page address as an address defining the first Overhead Page.; and
10 b. erasing the first Dedicated Overhead Block.

1 6. (Original) The method according to Claim 1 wherein the step of correlating the plurality
2 of consecutive page addresses to a respective plurality of consecutive Virtual Logical
3 Block Addresses is performed through a RAM space manager.

1 7. (Original) The method according to claim 6 further comprising the steps:
2 a. storing a logical address within a non-volatile correlation register within the Flash
3 Memory System; and
4 b. loading a physical address into a correlation register of the RAM space manager
5 upon power up.

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- 1 8. (Original) The method according to Claim 2 wherein the flag field within each Overhead
2 Segment further includes a used flag, an obsolete flag, and a defective flag.
- 1 9. (Original) The method according to Claim 8 wherein the step of identifying the first
2 available segment further comprises the step of examining select flags within select
3 Overhead Segments within the first page.
- 1 10. (Original) The method according to Claim 9 wherein the step of storing an address of the
2 first Dedicated Data Block in the Physical Address Register of the first available
3 Overhead Segment further comprises the step of setting the used flag within the first
4 available Overhead Segment to a second position, thereby indicating that overhead data
5 has been stored therein.
- 1 11. (Original) The method according to Claim 10 further wherein the step of storing an
2 address of the first Dedicated Data Block in the Physical Address Register of the first
3 available Overhead Segment further comprises the step of setting the obsolete flag in a
4 last used Overhead Segment to a second position, thereby indicating the last used
5 segment is obsolete; wherein the address of the first available segment consecutively
6 follows an address defining the last used Overhead Segment within the first page.
- 1 12. (Original) The method according to claim 3 wherein the step of consolidation is preceded
2 by a step of writing overhead data into a highest addressable overhead segment of a page
3 within the first dedicated overhead block.
- 1 13. (Original) The method according to claim 1 further comprising the steps:
2 a. marking as defective a dedicated overhead block; and
3 b. re-designating a dedicated data block as a dedicated overhead block.
- 1 14. (Original) A method of data storage within a Flash Memory comprising the steps:
2 a. mapping a non-volatile memory medium within the Flash Memory System into a
3 plurality of independently addressable, independently programmable and
4 independently erasable memory blocks including a plurality of Dedicated Data

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- 6 Blocks and a plurality of Dedicated Overhead Blocks comprising a first Dedicated
7 Overhead Block and a second Dedicated Overhead Block;
8 b. mapping each of the plurality of Dedicated Overhead Blocks into a plurality of
9 consecutively addressed Overhead Segments, wherein the plurality of segments
10 within each Dedicated Overhead Block are addressed according to an identical set
11 of distinct segment addresses, each segment comprising a Physical Address
12 Register and a Flag Field; and
13 c. correlating the first Dedicated Overhead Block to a first group of Virtual Logical
Block Addresses including a first Virtual Logical Block Address.

- 1 15. (Original) The method according to Claim 14 further comprising the steps:
2 a. receiving from a host a first set of User Data defined according to a first Virtual
3 Logical Block Address;
4 b. identifying a first available Overhead Segment within the first Dedicated
5 Overhead Block, the first available Overhead Segment comprising a lowest
6 addressable available Overhead Segment within the first Dedicated Overhead
7 Block, an available Overhead Segment comprising an Overhead Segment that is
8 unused, non-defective, and not obsolete;
9 c. storing the first set of User Data in a first Dedicated Data Block defined according
10 to a first Virtual Physical Block Address;
11 d. storing an address of the first Dedicated Data Block in the Physical Address
12 Register of the first available Overhead Segment.

- 1 16. (Original) The method according to Claim 15 further comprising the step of consolidating
2 all current Overhead Segments within the first Dedicated Overhead Block into
3 consecutive Overhead Segments within the second Dedicated Overhead Block, a current
4 Overhead Segment comprising an Overhead Segment that is used, non-defective, and not
5 obsolete.

- 1 17. (Original) The method according to Claim 16 wherein the step of consolidating the first
2 Dedicated Overhead Block into a second Dedicated Overhead Block comprises the steps:

- 3 a. moving data stored within a first current Overhead Segment in the first Dedicated
4 Overhead Block into a lowest addressable available Overhead Segment within the
5 second Dedicated Overhead Block, and
6 b. erasing the first Dedicated Overhead Block.

1 *Al* 18. (Original) The method according to claim 17 wherein the step of consolidation is
2 preceded by a step of writing overhead data into a last addressable segment of the first
3 dedicated overhead block.

1 19. (Original) The method according to Claim 14 wherein each Overhead Segment further
2 comprises an Error Correction Field for storing error correction data supporting the User
3 Data.

1 20. (Original) The method according to Claim 14 wherein the step of correlating is performed
2 through a RAM space manager.

1 21. (Original) The method according to Claim 15 wherein the flag field within each Overhead
2 Segment further includes a used flag, an obsolete flag, and a defective flag.

1 22. (Original) The method according to Claim 15 wherein the step of identifying the first
2 available Overhead Segment further comprises the step of examining select flags within
3 select Overhead Segments within the first Dedicated Overhead Block.

1 23. (Original) The method according to Claim 21 further comprising the step of setting the
2 used flag within the next available Overhead Segment to a second position, thereby
3 indicating that overhead data has been stored in the next available segment.

1 24. (Original) The method according to Claim 17 wherein the step of moving data stored in a
2 first current overhead segment into a first available overhead segment further comprises
3 the steps:

- 4 a. examining select flags within select Overhead Segments comprising the first
5 Dedicated Overhead Block, and

- 6 b. examining select flags within select Overhead Segments comprising the second
7 *A1* Dedicated Overhead Block.

1 25. (Original) The method according to clam 20 further comprising the steps:

- 2 a. storing a logical address within a non-volatile correlation register within the Flash
3 Memory System; and
4 b. loading a physical address into a correlation register of the RAM space manager
5 upon power up.

1 26. (Currently Amended) The method according to claim 14~~A~~ further comprising the steps:

- 2 a. marking as defective a dedicated overhead block; and
3 b. re-designating a dedicated data block as a dedicated overhead block.

1 27. (Original) A method of storing digital data within a Flash Memory System comprising the
2 steps:

- 3 a. mapping a non-volatile memory medium within the Flash Memory System into a
4 plurality of separately addressable, separately programmable and separately
5 erasable memory blocks comprising a plurality of Dedicated Data Blocks and a
6 plurality of Dedicated Overhead Blocks, the plurality of Dedicated Overhead
7 Blocks including a first Dedicated Overhead Block and a second Dedicated
8 Overhead Block;
9 b. mapping each of the plurality of Dedicated Overhead Blocks into a fixed overhead
10 field and a random overhead field, wherein the fixed overhead field of each of the
11 plurality of Dedicated Overhead Blocks comprises a plurality of consecutively
12 addressable Overhead Segments defined according to an identical sequence of
13 Overhead Segment addresses, and a random overhead field comprises a plurality of
14 consecutively addressable Overhead Segments; each Overhead Segment
15 comprising a plurality of registers including a Physical Address Register;
16 c. correlating the plurality of consecutively addressable Overhead Segment within the
17 fixed overhead field of the first Dedicated Overhead Block to a first group of
18 consecutively addressable Virtual Logical Block Addresses including a first fixed
19 segment correlated to a first Virtual Logical Block Address.

- 1 28. (Original) The method according to Claim 27 further comprising the steps:
2 a. marking as defective a dedicated Overhead Block; and
3 b. re-designating a Dedicated Data Block as a Dedicated Overhead Block.
- 1 29. (Original) The method according to Claim 27 wherein the step of correlating the plurality
2 A1 fo consecutively addressable Overhead Segments within the fixed overhead field of the
3 Dedicated Overhead Block to a first group of consecutively addressable Virtual Logical
4 Block Addresses is performed through a RAM Space Manager.
- 1 30. (Original) The method according to Claim 29 further comprising the steps:
2 a. storing a logical address within a non-volatile correlation register within the Flash
3 Memory System; and
4 b. loading a physical address into a correlation register of the RAM Space Manager
5 upon power up, thereby correlating a logical address with a physical address in the
6 RAM Space Manager.
- 1 31. (Original) The method according to Claim 27 further comprising the steps:
2 a. receiving from a host a first set of User Data defined according to the first Virtual
3 Logical Block Address;
4 b. storing the first set of User Data in a first Dedicated Data Block defined according
5 to a first Virtual Physical Block Address;
6 c. storing overhead data corresponding to the first Virtual Logical Block Address in
7 the first Overhead Segment within the first Dedicated Overhead Block.
- 1 32. (Original) The method according to Claim 31 wherein the step of storing overhead data in
2 the first Overhead Segment comprises the steps:
3 a. identifying the first fixed segment within the fixed overhead field of the first
4 Dedicated Overhead Block;
5 b. determining if the first fixed segment is available;
6 c. storing the overhead data supporting the first Virtual Logical Block Address in the
7 first fixed segment when the first fixed segment is available; and
8 d. storing the overhead data corresponding to the first Virtual Logical Block Address
9 in a first random Overhead Segment when the first fixed segment is not available,

10 the first random segment comprising a lowest addressable unused and non-
11 defective Overhead Segment within the random overhead field of the first
12 Dedicated Overhead Block.

1 33. (Original) The method according to Claim 31 wherein the step of determining that the first
2 fixed segment is available comprises the step of examining flags within the first fixed
3 segment.

1 34. (Original) The method according to claim 31 further comprising the steps:
2 A1 a. mapping the random overhead field of each Dedicated Overhead Block into a
3 plurality of pages, each page comprising a plurality of segments;
4 b. designating a lowest addressable segment in each page within the random overhead
5 field as a Status Segment; and
6 c. mapping each status segment into a plurality of registers to function as an update
7 map.

1 35. (Original) The method according to Claim 31 wherein the step of storing overhead data
2 corresponding to the first Virtual Logical Block Address in the first random Overhead
3 Segment further comprises the steps:
4 a. locating a last previous segment used for storing overhead data supporting the first
5 Virtual Logical Block Address;
6 b. setting an obsolete-flag corresponding to the last previous segment to a second
7 value, indicating that overhead data within the last previous segment is now
8 obsolete; and
9 c. setting an used-flag in the first random Overhead Segment to a second value,
10 indicating that overhead data is now stored in the first random Overhead Segment.

1 36. (Original) The method according to Claim 34 wherein the update map contains one
2 register corresponding to each segment within the fixed overhead field of the first
3 Dedicated Overhead Block.

1 37. (Original) The method according to Claim 27 further comprising the step of consolidating
2 current overhead segments within the first Dedicated Overhead Block into the second
3 Dedicated Overhead Block when the first Dedicated Overhead Block becomes full.

1 38. (Original) The method according to claim 37 wherein the step of consolidating current
2 overhead segments comprises the steps:

- 3 a. correlating a second Overhead Segment within the fixed overhead field of the
4 second Dedicated Overhead Block to the first Virtual Logical Block Address;
5 b. copying data within the first overhead segment into the second overhead segment.

1 39. (Original) A method of storing digital data within a Flash Memory System comprising the
2 steps:

- 3 a. mapping a non-volatile memory medium within the Flash Memory System into a
4 plurality of separately addressable, separately programmable and separately
5 erasable memory blocks comprising a plurality of Dedicated Data Blocks and a
6 plurality of Dedicated Overhead Blocks, the plurality of Dedicated Overhead
7 Blocks including a first Dedicated Overhead Block and a second Dedicated
8 Overhead Block;
9 b. mapping each of the plurality of Dedicated Overhead Blocks into plurality of Super
10 Overhead Fields, including a first Super Overhead Field within the first Dedicated
11 Overhead Block;
12 c. mapping each of the plurality of Super Overhead Fields into an identical set of
13 consecutively addressable Overhead Segments, each of the plurality of Overhead
14 Segments comprising a plurality of registers including a Physical Address Register;
15 d. correlating a first Super Virtual Logical Block Address defined by consecutive
16 Virtual Logical Block Addresses to the first Dedicated Overhead Block; and
17 e. correlating a first Virtual Logical Block Address within the first Super Virtual
18 Logical Block Address to a first Overhead Segment Address within the first
19 Dedicated Overhead Block.

1 40. (Original) The method according to Claim 39 further comprising the steps:

- 2 a. marking as defective a dedicated Overhead Block; and
3 b. re-designating a Dedicated Data Block as a Dedicated Overhead Block.

1 41. (Original) The method according to Claim 39 wherein the step of correlating a first Super
2 Virtual Logical Block Address to the first Dedicated Overhead Block is performed through
3 a RAM Space Manager.

1 42. (Original) The method according to Claim 41 further comprising the steps:
2 a. storing a logical address within a non-volatile correlation register within the Flash
3 Memory System; and
4 b. loading a physical address into a correlation register of the RAM Space Manager
5 upon power up, thereby correlating a logical address with a physical address in the
6 RAM Space Manager.

1 43. (Original) The method according to Claim 42 wherein the non-volatile correlation register
2 is within an extension field of a Super Overhead Field of a Dedicated Overhead Block.

1 44. (Original) The method according to Claim 39 further comprising the steps:
2 a. receiving from a host a first set of User Data defined according to the first Virtual
3 Logical Block Address;
4 b. storing the first set of User Data in a first Dedicated Data Block defined according
5 to a first Virtual Physical Block Address;
6 c. storing overhead data corresponding to the first Virtual Logical Block Address in a
7 first Overhead Segment defined by the first Overhead Segment Address within the
8 first Super Overhead Field.

1 45. (Original) The method according to Claim 44 wherein the step of storing overhead data is
2 preceded by the step of incrementing from a previous Super Overhead Field within the
3 first Dedicated Overhead Block to the first Super Overhead Field.

1 46. (Original) The method according to Claim 44 wherein the step of storing overhead data
2 further comprises the step of setting an used-flag within the first Overhead Segment to a
3 second position indicating that overhead data is stored within the first Overhead Segment.

- 1 47. (Original) The method according to Claim 46 wherein the step of storing overhead data
2 further comprises the steps:
3 a. locating a last previous segment within the first Dedicated Overhead Block used
4 for storing overhead data supporting the first Virtual Logical Block Address; and
5 b. setting an obsolete-flag within the last previous segment to a second value,
6 indicating that overhead data within the last previous segment is now obsolete.
- 1 48. (Original) The method according to Claim 39 further comprising the step of consolidating
2 current overhead segments within the first Dedicated Overhead Block into the second
3 Dedicated Overhead Block when overhead data has been stored in a final Super Overhead
4 Field within the first Dedicated Overhead Block.
- 1 49. (Original) The method according to claim 48 wherein the step of consolidating current
2 overhead segments comprises the steps:
3 a. identifying a first current Overhead Segment defined according to the first
4 Overhead Segment Address within the first Dedicated Overhead Block ; and
5 b. copying data within the first current Overhead Segment into a second overhead
6 segment defined according to the first Overhead Segment Address within the first
7 Super Overhead Field of the second Dedicated Overhead Block.
- 1 50. (Currently Amended) A flash memory device for storing User Data comprising a plurality
2 of separate, independently addressable, independently programmable and independently
3 erasable non-volatile Physical Memory Blocks distinguishably defined by a plurality of
4 Physical Block Addresses including:
5 a. a plurality of dedicated data Blocks for storing User Data; and
6 b. a plurality of Dedicated Overhead Blocks for storing Overhead Data including a
7 first Dedicated ~~Data~~ Overhead Block and a second Dedicated ~~Data~~ Overhead
8 Block.
- 1 51. (Original) The Flash Memory device according to Claim 50 wherein each Dedicated
2 Overhead Block is identically comprised of a plurality of separately addressable Overhead
3 Pages, each block following an identical sequence of page addresses.

1 52. (Original) The Flash Memory Device according to Claim 51 wherein each Overhead Page
2 is comprised of a plurality of independently addressable and independently programmable
3 segments, including a plurality of Overhead Segments.

1 53. (Original) The Flash Memory Device according to Claim 52 wherein the plurality of
2 independent Overhead Segments are used for storing Overhead Data, each Overhead
3 Segment supporting one Virtual Logical Block of User Data, each Overhead Segment
4 comprising:

- 5 a. physical Address Register for storing a Physical Address for locating
6 corresponding User Data; and
7 b. a flag field.

1 54. (Original) The Flash Memory Device according to Claim 53 wherein a first group of
2 Virtual Logical Block Addresses including a first VLBA are assigned to the first
3 Dedicated Overhead Block, such that overhead data generated in support of the first
4 VLBA will be stored in an Overhead Segment within the first Dedicated Overhead Block.

1 55. (Original) The Flash memory Device according to Claim 54 wherein sequential VLBA's
2 within the first group of VLBA's are respectively correlated to sequentially addressed
3 Overhead Page Addresses within the first Dedicated Overhead Block, including a first
4 Virtual Logical Block Address correlated to a first Overhead Page within the first
5 Dedicated Overhead Block, such that Overhead Data supporting the first Virtual Logical
6 Block Address will be stored in an Overhead Segment within the first Overhead Page.

1 56. (Original) The Flash Memory Device according to Claim 54 wherein each of the plurality
2 of Dedicated Overhead Blocks further comprise of a fixed Overhead Field and a Random
3 Overhead Field, the fixed Overhead Field being comprised of a plurality of consecutively
4 addressed Overhead Pages, and the Random Overhead Field being comprised of a plurality
5 of consecutively addressed Overhead Pages.

1 57. (Original) The Flash Memory Device according to Claim 56 wherein consecutively
2 addressed segments comprising the consecutively addressable Overhead Pages within the

3 Fixed Overhead Field of the first Dedicated Overhead Block are respectively correlated to
4 sequentially addressed Virtual Logical Block Addresses.

1 58. (Original) The flash memory device according to Claim 57 wherein the plurality of
2 consecutively addressed segments comprising the consecutively addressed Overhead
3 Pages within a first Overhead Page within the Random Overhead Field of the First
4 Dedicated Overhead Block comprise a Status Segment and a plurality of Overhead
5 Segments, the Status Segment defined according to a lowest segment address among the
6 plurality of segments within the first Overhead Page.

1 59. (Original) The Flash Memory Device according to Claim 54 wherein each Dedicated
2 Overhead Block is further comprised of a plurality of Super Overhead Fields including a
3 first Super Overhead Field, a Super Overhead Field comprised of a whole number of
4 pages, each Super Overhead Field within the first Dedicated Overhead Block comprised of
5 an identical number of pages, wherein consecutive Overhead Segments within first Super
6 Overhead Region are respectively assigned to consecutively addressed Virtual Logical
7 Block Addresses which comprise a first SuperBlock.

1 60. (Original) The Flash Memory device according to Claim 50 further comprising a controller
2 for regulating and controlling the operation of the Flash Memory.

1 61. (Original) The Flash memory device according to Claim 50 further comprising a volatile
2 RAM Space Manager, the Space Manager comprising a plurality of correlation fields for
3 correlating virtual addresses and physical addresses.

1 62. (Original) The Flash Memory device according to claim 61 wherein the Space Manager
2 comprises a Flag Register comprising a plurality of Status Flags.

1 63. (Original) The Flash Memory device according to Claim 62 further comprising a means
2 for loading data from a non-volatile memory area into the Space Manager on start up.

1 64. (Original) The Flash Memory device according to Claim 62 further comprising a means
2 for loading data into the Space Manager upon a reset command.

1 65. (Original) The Flash Memory device according to Claim 50 further comprising means for
2 generating error correction data corresponding to User Data stored within the Flash
3 Memory System.

1 66. (Original) The Flash Memory device according to Claim 50 comprising a means for re-
2 designating a Dedicated Data Block to function as a Dedicated Overhead Block in the
3 event of failure of an existing Dedicated Overhead Block.
